NAS7.000914
NASA - JPL
SSIC No. 9661

INFORMATIONAL MEETING

NASA/JET PROPULSION LABORATORY

26 MAY 1999

ATTENDEES:

Charles L. Buril, JPL

Craig Christmann, DTSC

Mark Cutler, Foster Wheeler

Richard Gebert, DTSC

Vitthal Hosangadi, Foster Wheeler

Joe Hwong, DTSC

Mark Losi, Foster Wheeler

B. G. Randolph, Foster Wheeler

Mark Ripperda, USA EPA via telephone

Peter Robles, Jr., NASA

Vera Melnyk Vecchio, DHS

Gary Yamamoto, DHS

Also Present:

Wagner Jackson, U.S. DOJ

Jane Mahoney, U.S. DOJ

Reported by: Louise K. Mizota, CSR 2818

Pasadena, California
May 26, 1999
1:17 P.M.

BURIL: I'm going to pass around a sheet. For those of you who are new to us, the way that we keep notes on all the meetings that we do of this size, we have a transcript made because that's just the easiest way to be sure that everything is down and there's no misinterpretation. We've been doing this for years. It's worked out very well for us.

The agenda here is pretty light for the most part. Gary is the principal player on most of this. And I've got a couple of things I wanted to go through first to try to bring Gary and Joe up to speed on the site a little bit. And then on the basis of that information, we can maybe talk a little bit about this Policy 97-005 and try to get some understanding of how it applies to our site.

Mark, unfortunately, you're going to be at somewhat of a disadvantage there on the phone because I'm using some video -- not video, but graphics here. I don't have ones to hand out to everybody. First of all, let me tell the RPMs that what I'm going to be showing to everyone today are

the modified plume maps for the OU-2 -- excuse me, OU-1/3 RI, which is, as you know, supposed to be finished up here the next three weeks, I think.

They incorporate all the changes that we talked about back in -- when did we talk about that? February time frame?

CUTLER: Yeah. Somewhere in there.

BURIL: Somewhere in there. So I'm not going to hand these out because obviously they haven't been reviewed yet, and so forth, but they give the indication, at least, of what we're dealing with here at JPL. And I think that's going to be very helpful for folks to be able to understand that. So I just wanted to preface that and take a quick straw poll if anyone has a problem with that.

Okay. Great.

I brought along a big map. We've got the one up there. Mark, for your benefit, I'm looking at the foam-backed one that we always use. And then I also have a larger map that shows all of the various municipal wells and monitoring wells on JPL and so forth.

I don't know if that's going to sit up there by itself.

ROBLES: I'll have to get a clip.

BURIL: Actually, Pete, if you had a -- oh. All right. That works. Good. I'll be darned. Okay.

Basically, the site is -- let's see. I'm going to walk up there.

ROBLES: Why don't you walk up there. I'll get some clips.

BURIL: Just to orient everybody here with what we're dealing with. Here is the site right here. And we've got our monitoring wells in a variety of colors here. The diamond-shaped, or rather pyramid-shaped ones are multi-port wells. Those are the ones that we use to be able to sample at various depths throughout the aquifer.

The round blue ones are the shallow monitoring wells that we have. And those just go into the upper part of the aquifer.

The squares are municipal production wells. And they're from various organizations throughout the area.

We've got Pasadena folks on these four here, Lincoln Avenue Water Company on these two, Rubio Canyon and Las Flores out in this area, and then up in this area Valley Water Company and La Canada Irrigation District.

Generally, the groundwater flows in this

direction. And what we've found over the course of our investigation is that we've picked up contaminants in several of these wells as well as our own. And basically, we've completed all of the investigative work that we had planned, and the results have come out. And I'm only going to spread these on the table for the benefit of the folks to take a look at.

What we've found is that the aquifer is actually broken up into three layers that are important to the site. There's actually four that we've found. The fourth layer, which is the deepest layer, you don't see that occurring until you're well out in the area of MW-20, which is in the far lower right-hand corner of the site.

(Ms. Melnyk Vecchio entered the room.)

BURIL: And as a result, we don't really deal with that one because we don't see contamination in that area.

We've just had another person come in. Vera, I forgot your last name.

VECCHIO: Melnyk Vecchio.

BURIL: Did you get that, Mark?

RIPPERDA: No.

BURIL: Welcome. We're just kind of going

through a little bit of the site and a little of the history.

What we found principally were three volatile organics that appeared that there might be some concern with, and one inorganic constituent, perchlorate. What I'm going to do now is just show you the results as a series of plume maps. I'm going to use the most recent ones that we had, which are from January and February of 1998.

What we did is we broke these down according to the various chemicals and three aquifer layers that we found to be impacted by the various constituents.

Let's see. Joe, I don't know if you want to come down here. You can maybe see a little better. You can kind of get a feel for it. All these guys have seen these. And Vera and Gary can have a look at what I'm dealing with here, too.

What I'm looking at first, Mark, is the aquifer 1 -- excuse me, aquifer layer 1 carbon tetrachloride plume map. Basically, it shows that everything is right here on the site and doesn't appear to be, you know, much of a problem when you look at it from that perspective.

When we get past aquifer layer 1 and we go

down to aquifer layer 2, what we find is that the municipal wells in the area have a fairly dramatic impact on the distribution of the contaminants in the area.

Here is carbon tetrachloride for the same time frame in the second layer.

What appears to be happening is that the Pasadena wells, based on tests that we've been able to do in monitoring water levels and such, the Pasadena wells, particularly the Arroyo Well, appear to have the ability to draw the contaminants down through the layers and into the second aquifer layer. And, in fact, I think the first layer and second layer division --

Isn't the aquifer portion that's got the fine silt, isn't it kind of thinned out, almost gone in the area of JPL?

CUTLER: Yeah. Right. It's almost on their eastern boundary of JPL, about where that boundary stops.

BURIL: Okay.

CUTLER: So right from the eastern boundary to the east is where it's really defined as two layers. From that boundary west it's really one --

BURIL: It's kind of mixed.

CUTLER: -- big pile of sand, basically.

BURIL: The distinction in layers here on the site, it doesn't really exist that much, yeah, which is why we see the movement like this, I think, being so pronounced.

You can see the various municipal wells there.

Again, this is for carbon tetrachloride. This is a constituent that we view as somewhat unique to JPL because we haven't found it anywhere else.

YAMAMOTO: Okay. In other words, nothing upstream.

BURIL: Nothing that anyone has found upstream thus far.

On the third layer we see an interesting kind of distribution in so much as we don't see anything really on site, with the exception of Well 12. But then you see how it's been pulled around by the various water supply wells.

Moving on to --

YAMAMOTO: The third layer exists on the JPL site?

BURIL: The third layer does exist on the JPL site, but there's no contamination there that we can

find.

YAMAMOTO: There's a clay or something like that?

BURIL: A silt-rich area there that helps define the two layers, 2 from 3 on the JPL site.

Am I correct on that?

CUTLER: Right. The way that we look at this is that aquitard between layers 2 and 3 almost extends to the western edge of the site. So if you're looking at the site -- this will just take a second, Chuck.

BURIL: Sure.

CUTLER: The aquitard between layers 1 and 2 maybe extends up to about in this area. Between 2 and 3 it extends all the way up to maybe this area.

And then over here it's one big pile of sand almost all the way to bedrock, if that makes sense.

YAMAMOTO: Yeah.

CHRISTMANN: Can you give a little explanation of what the less permeable materials are in comparison to the more permeable stuff?

CUTLER: It's more the silts, maybe a little bit of clay in the silts. It's fairly coarse material out here. The way these layers are defined, we have

these multi-port wells with screen intervals at five different depths in the aquifer. When these production wells are on, they induce a vertical downward flow and that flow gets inhibited by these silt-rich layers. So depending on what screen you're in is defined by how much that drawdown is inhibited, or enhanced. This may be confusing. It's defined by hydraulic head.

YAMAMOTO: In each of those layers.

CUTLER: With depth. Right.

BURIL: The thing that tipped us off to the fact that this was occurring was that when we measured the water levels in the various screens and water pressures in the various screens in the wells, while the municipal wells were operating, we saw pretty large changes in the head, which we couldn't explain any other way.

YAMAMOTO: Sure.

BURIL: Then when we went through the drill logs and started looking at it, we realized that there were these silt-rich layers that appeared to be creating this inhibited flow between the different places, different layers.

YAMAMOTO: Right.

HWONG: I'm sorry. What is the thickness of

those layers 1, 2, 3 you talk about, the thickness?

BURIL: Thickness of the layers?

CUTLER: The upper aquifer layer is about from the water table down about 100 feet.

HWONG: 100 feet?

CUTLER: The second aquifer layer is from that 100 foot depth down another 150 feet. And the third aquifer layer -- and this varies. This is just in a general sense. The third aquifer layer is about 300 feet thick.

ROBLES: So you got 100, 150 and 300.

CUTLER: In general terms.

BURIL: They vary in thickness depending --

HWONG: Those downgradient wells -- I mean the municipal wells, they screen all the way from the first layer to third layer?

CUTLER: That is variable. Right. And that's another issue, is we don't know which layer gets the most water produced from when these wells are on. They're screened in multiple layers. We don't know where a well gets most of its water.

ROBLES: So we don't know if the water is coming from a minimally contaminated aquifer or maximumally contaminated aquifer.

CUTLER: Yeah. Right.

BURIL: We don't have the distinction with these long screened interval wells as to which portion of the screen is actually producing the most water.

ROBLES: Do purveyors of water have multi-port wells, too?

BURIL: No. They are not designed to do discrete layer sampling. They are just designed to take water from the most permeable zones they were able to identify at the time.

ROBLES: There's usually one or two.

BURIL: I think the Arroyo Well has got like four or five screened intervals, doesn't it?

CUTLER: Yeah. They're multiple screens. Depends on the well. They would pick and choose sandy intervals. There may be up to 20 individual screened sections of the well.

ROBLES: So any water coming out of those production wells could come from any one of the aquifers anywhere. Okay.

BURIL: What I've got up here now is layer 1 for trichloroethene. This one is kind of interesting because we appear to have what looks like an upgradient source in addition to the JPL source. You can see that some of the wells up here have the small quantities here. We have seen larger

quantities on occasion, I believe, haven't we, Mark, or are these the largest ones that we have records of?

CUTLER: I'm sorry?

BURIL: For the upgradient wells, the Valley Water wells.

CUTLER: Well, that's in that time frame when we did the sampling on site. That was the levels closest to when we took our samples.

BURIL: Okay. We have seen higher levels than this. And this is the 1996 time frame. Let me show you the most recent one that we have.

Here is the January-February '98. Very similar, where down here at MW-21 we see 16 parts per billion, but yet we see 150 here at our Well MW-24 and it fades off to just about nothing. And they have seen concentrations at this end in the 10s and higher. So we think that there's good indication that there may be something coming from down here. There's more to it than just that. We've also done some water type tests, mineral analysis, things of that nature. And the water types located at this well tend to match those up here rather than the water types that we see here. The water type that we see here is principally

either sodium or calcium calcite, is it?
CUTLER: Carbonate.
BURIL: Carbonate. Thank you. Carbonate type water, where over here it's more characterized by higher quantities of sulfate and --
CUTLER: Chloride.
BURIL: And chloride. Thank you.
CUTLER: One quick note, too, Chuck, when we look at the organic levels in the production wells, keep in mind that they're screened over several hundreds of feet, plus these samples are collected with turbine pumps. So we use numbers, TCE concentration values, as an indication that TCE is there, not so much that the level is accurate compared to the way we sample. So that 10 part per billion could actually be higher upgradient. We're using the fact that there is TCE upgradient, not the fact that it's 10. It's an important point, I think, when we get into some of our discussions.
YAMAMOTO: The City hasn't made any attempt to try to do sampling at --
BURIL: At various levels, no.
CUTLER: Not that we're aware of.
BURIL: No, not that we're aware of, at least.
When we look at the second layer for the

same time frame in '98, you can see that we've got still small amounts of contamination showing up here and nondetect pretty much throughout the Laboratory, with the exception of a minor hit at the most contaminated well that we have. And we're still using the same numbers that we used before.
The interesting thing is that we see a little bit bigger concentrations right out in the middle of this. It appears that the JPL influence is beginning to dwindle, but this is still out there.
HWONG: So those upgradient wells, they're operating, right? They're still pumping water?
BURIL: Yes. They actually have an air stripper associated with some of these.
YAMAMOTO: VOCs handle them. Probably can't determine which --
BURIL: They can't figure out where it's coming from. Neither can we.
YAMAMOTO: Right.
BURIL: The last layer is very similar to layer 2 as far as trichloroethene is concerned, but in this case basically everything is out of JPL. There is no contribution occurring, but we're still seeing contamination down deep in layer 3 out to the east

of us. And we still think there's something to the west of us that's contributing to that.
The last volatile that we think is a concern potentially for the JPL site is 1,2-dichloroethane. Looking at the latest one of that, this was one that appears to be only on site. And, in fact, you can see just this tiny little blip on the map around MW-7, which is one of our more contaminated wells. We're thinking that this is a byproduct of some form of degradation of TCE because we're not seeing it any place else except here on site.
And in aquifer layer 2 -- in fact, it wasn't in any other aquifer layer. That's why I'm not seeing a 1998 map. This is what it was in 1996. It just shows this tiny little area right here, a little .9 ppb. Everything else was clean.
CHRISTMANN: You said that was 1,2-DCA, Chuck?
BURIL: Yes. 1,2-DCA.
CHRISTMANN: Have you ever evaluated the possibility that that was -- were there any fuel tanks, gasoline tanks? Because that one has been used as a fuel additive in the past.
BURIL: We have had underground tanks here at JPL, but when we pulled them here to meet the new

tank standards, we didn't find any contamination. So we're hopeful that we didn't have any problem like that.
CHRISTMANN: Okay.
BURIL: Tetrachloroethene is one that is also present in the groundwater. This is the one that we think gives rise to some real thoughts to having upgradient sources. Because here, this again is in '96. Let me get the '98 one. Hold on.
Because here we're seeing concentrations in these wells here that are far higher than anything we've ever seen on site by an order of magnitude, sometimes several orders of magnitude. And so there appears to be something contributing, at least in aquifer layer 1, to the overall plume. And on occasion it impinges on JPL. And we're seeing these smaller numbers as a result.
You get out here, it tends to die off except that Las Flores here has got a hit of -- what is that, 4.8 parts per billion. I think at one time they actually exceeded 5 and had to shut down for a period of time.
Looking at the tetrachloroethene again on the second layer, you can see the influence of JPL has all but disappeared. We see small hits on the

wells to the south of us, but we're still seeing hits in our Well MW-21, which is in Oak Grove Park, still have -- using the same numbers again there. Now we're picking up hits in the other production wells as well as our Well MW-19.

So there appears to be some influence going on out there that is introducing tetracloroethane into our area that is simply not part of JPL's issue.

And then last, to point out just to complete the aquifer layers, here is aquifer layer 3. You can see again it's still quite prevalent. But in this particular instance JPL has nothing in it at all.

YAMAMOTO: Wasn't the upgradient communities on septic tank and leach fields?

BURIL: Yes.

YAMAMOTO: There's a common septic tank cleaner by Amway had lots of PCE in it.

BURIL: In fact, my own in-laws lived in La Canada for almost 40 years and they described using exactly what you're talking about to keep their septic tank working properly.

CHRISTMANN: The other issue that we've discussed with JPL previously, and we're pursuing,

is the fact that there are a number of dry cleaners located directly adjacent to those wells that are upgradient.

VECCHIO: And they're still unsewered, Gary.

BURIL: Yeah, they're still unanswered. I have apparently left behind my perchlorate maps. They look very similar to the PCE maps. But we do have a strong source here.

ROBLES: Do you need a copy?

BURIL: Do you have it here? Yeah. If I could get you to get that, that would be great. I just grabbed these out of my own copy here and I guess I didn't grab a thick enough stack.

They're very similar to the PCE results -- rather, TCE results. So you see both an influence from off site and an influence from on site.

The off-site influence appears like it might be associated with the injection of Colorado River water that's done by Valley Water Company. We can actually see that on there, which is not good.

YAMAMOTO: Well, actually, what you could use as a tracer, because you've got Colorado River water, there's an awful lot of sulfate in it and use that as a tracer.

BURIL: We've actually picked that up and we've

done exactly what you're talking about in making that evaluation.

Thanks, Pete. Let me pull this out.

ROBLES: Here it is.

BURIL: Here is perchlorate in aquifer layer 1.

ROBLES: Yes.

BURIL: Where we appear to have some influence up here, because we are seeing 14 parts out here in Well 21. And we are picking up small amounts out here in the Valley wells. We have a pretty strong source up here. We've seen as much as 700 and 1200 parts per billion up here in JPL.

VECCHIO: This is the first layer here?

BURIL: Yes, it is.

VECCHIO: And we've got some hits over here at Rubio and Las Flores.

BURIL: That's something that, being discontinuous as it is and not having a -- well, basically having a long line of monitoring wells which show no contamination, leads us to believe that there may be other considerations in dealing with this. Maybe use of Colorado River water over the years is one possibility. We've found that commercial fertilizers also contain perchlorate, which I think you guys are probably well aware of.

VECCHIO: Yeah.

BURIL: So that use may have contributed to seeing this out here.

VECCHIO: I think Rubio also has these ASR wells which are -- where they actually inject back into the aquifer when they are not using --

BURIL: Oh, really?

VECCHIO: Yeah. I think Rubio has one of those.

BURIL: I didn't know that.

ROBLES: So that could be a source of perchlorate there, that they reinjected something that might have had an impact.

VECCHIO: Because I know Pasadena has them and I know that Rubio was a site. They had a well right at their company door. They were going to do that. But I haven't worked with them, you know, for quite a while so I don't know what's going on there.

BURIL: Here is aquifer layer 2. And it shows a very similar pattern to TCE where we have the low concentrations apparently coming in from upgradient and very strong influence here being exerted on the contaminants on JPL.

I'll share with you that the Arroyo Well has been shut down now since July of '97 and it's still shut down.

ROBLES: What was it shut down for?
BURIL: Perchlorate.
VECCHIO: Perchlorate.
ROBLES: How much?
BURIL: Over 140 the last time they tested.
ROBLES: Has it gone down?
BURIL: They don't run it to find out. They don't have any way of dealing with the water when they pump it out.
ROBLES: So we don't know if it's gone down.
BURIL: We don't know if it's gone down, up, or stayed the same. They don't monitor it when it's shut down. We have seen -- in our own Well 17, we can see it. It's still up around in the 20s and 30s parts per billion.
ROBLES: What happens if it goes away? They can turn it back on. How do they know that?
BURIL: That's a good question. I don't know.
VECCHIO: The more likely scenario is that the plume is moving. Those levels have probably not gone down. They can also see a trending upward in Well Number 52.
BURIL: Thank you. I was just going to mention that. Well 52, it shows a 15 part per billion here. They have the southernmost wells shut down right now

for maintenance. The last information I got from City of Pasadena indicated that Well 52 was up into the mid 40s, I think it was.
VECCHIO: Right. And that's trending upward.
BURIL: Right.
YAMAMOTO: How about Lincoln? They were --
BURIL: Lincoln's wells are surprisingly clean.
YAMAMOTO: Gone down now after they were -- they were going to go over.
BURIL: Yeah. We are mystified by that, as I think Lincoln is, but we're grateful for it at the same time.

Here is layer 3, again showing some contribution out here, and then with the Arroyo Well and Well 17, and basically nothing coming off the JPL site. Again, with Rubio Canyon and so forth out here.

I've just tried to give you the capsule of what we've got as fast as I could here because this is, as you can tell, a pretty complex site. And there are a number of other factors that go into the analysis that we've done that I haven't taken the time to explain.

Before I move on beyond this, do any of you folks who are new to the project, or anyone

else, have questions about what we've shown you so far?

Okay.

ROBLES: I just wanted to clarify. This is the well that has been shut off right here. Right?
BURIL: Yes. Correct.
ROBLES: There is no perchlorate in the Lincoln wells?
BURIL: There's some, but it's not high enough to be an action level issue.
ROBLES: What about these three?
BURIL: Well 52, which is the next one down from Arroyo, is in the mid 40s right now. That one is under 18 but slowly climbing, and that one is, I think, just about completely clean.
ROBLES: So these two are shut off?
BURIL: All four of them are shut off right now because they're doing maintenance. What I've been told is they can't run Well 52 without Ventura and Windsor running as well because they can't blend down to below the action level. They cannot run Arroyo at all because they cannot generate volume sufficient enough to blend.
VECCHIO: Right.
ROBLES: Okay.

VECCHIO: Because they all go into one reservoir, Windsor Reservoir, and then they have to blend with purchased water from MWD. They were relying on actual blending with the wells, but that's no longer a viable alternative.
BURIL: Right. Okay.

The reason that we asked the folks from DHS to come in and help us today is we're right now on the point of doing a feasibility study for the JPL site. And we've gone through a number of scenarios trying to identify something that would be useful in terms of meeting all the requirements, the ARARs that are imposed on this, and maybe in the process allow Pasadena or others to either begin operating again or continue operations as time goes by.

We've come up with what we think is a pretty good solution. We thought it was pretty good up until the point where I was at that Raymond Basin Management Board meeting where you introduced this. I understand that it was done a couple of years ago, about 18 months ago, it looks like, but none of us had ever heard of the policy and it looks like it has some potential impact to everything that we're thinking of doing.

What I'd like to do is to give you a little bit of an overview of what the remedial option is that we're thinking of right now in concept and then just turn it back to you and say how would this policy work in trying to implement something like that.

Okay. Basically, we've got a two-pronged approach that we're thinking of trying to use here at JPL. The first prong of the approach deals with dealing with the on-site contamination. And we are thinking that we would install a pump-and-treat system for the JPL site itself. It would be sized somewhere around 500 gallons a minute. We would treat for all the constituents that are of concern. So we would have both VOC and perchlorate treatment to knock those constituents out.

The ultimate disposal of the water would either be through reinjection back into the aquifer or turning it to one of the water purveyors in the area, possibly City of Pasadena, Lincoln Avenue, anyone who would reasonably feel comfortable taking it, and we would have permission to do so.

ROBLES: The decision would be made by Raymond Basin, whether they want it or whether we can reinject it.

BURIL: Or just what would happen with that.

The second part of this is trying to deal with the migration of material that's already off the site, and also to restore the aquifer as required by the NCP.

There we're looking at using the well at -- rather the Arroyo Well for Pasadena, either that specific well or a well that we might install ourselves. We would have that sized sufficiently to basically capture anything that is beyond the 500-gallon a minute well, as well as prevent anything that's to the east of the Arroyo from migrating any further.

The water would be treated either through the existing VOC plant or perhaps through a separate plant, depending upon how the configuration of this goes. And the water then would be also treated for perchlorate and then it would be turned over to a water purveyor, or reinjected.

Now, that's kind of the large concept idea. When it comes right down to it, our specific goal would be to have just the Arroyo Well being treated for perchlorate, and whatever other ones still require VOC treatment, they would continue to receive that. All the water would be turned over,

more than likely, to Pasadena for drinking water use. And the hot spot reduction, as we call it, at the JPL site would also have a separate plant, but then that water would also be turned over to the City of Pasadena for drinking water use.

That is our best-case scenario in terms of remediation of the area. And there are numerous variations on that theme.

Now, the big concerns, of course, are public acceptance, acceptance by the City of Pasadena, because we have not really broached this with them yet. We wanted to deal with the folks in the regulatory areas first before we broach the entire subject with the City of Pasadena, to learn what constraints there might be on us for doing this kind of thing, which is where 97-005 steps right into the picture as to what would be required to do something like this.

ROBLES: The second thing is that by reading the guidelines, we feel worst case would be is to have a closed-loop system, which would basically have an on-site system, have some wells out there in the Arroyo Seco, pump it back so that a closed-loop system exists. So therefore, no water would be given to the purveyors and it would stay as cleaned

for all of the constituents and thereby -- because as we read it, we can't give water out. First of all, we wanted you to give us an idea of what you think that impact is going to be of this policy.

BURIL: If you could walk us through the policy itself. We can read it. It's kind of scary, quite honestly, in some of the things that we're talking about. If you can give us some indication of how certain of these things might apply, it would help us a lot.

We're really at a point right now where this policy is going to help us or hinder us, depending upon how we interpret it, in implementing a remedial action, because it's going to perhaps tell us that we have to have more treatment, that we have to do potentially other work, any number of things, and trying to understand how you folks are interpreting and implementing it is key.

YAMAMOTO: Sure. Well, you brought some and I've got some, so -- copies of the policy. So that probably is a starting point.

This policy in some areas can be a hindrance. I would say in areas like in Northern California, where they have plenty of water around, this policy is intended to be a hindrance to it.

Okay? Because if they have available water nearby that they can easily go to as far as not having to run around supplies, that's what they should be going to.

In Southern California it's a little bit different since we've got probably more people and more people coming than we can supply. So that as more contamination is found, resources become depleted and it isn't so easy to say throw that away.

However -- so this policy isn't a hindrance, but however, it's a policy we feel you need to go through so that when it comes down to the point of approving a project, that people that are getting this water can feel confident that it's acceptable and whatever, that it's gone through some kind of review process or evaluation, okay, and that's why at the end there's a public hearing.

So even though we may all do and we may say it's 100 percent okay, if the people don't want it, then that's the end of it. Okay? That has happened in a community up in the Silicon Valley where they treated for actually a chemical that's not even a carcinogen. It's 1,2,3-trichloroethane. Our standard is I think 200 parts. And they were

treating it down to nondetect. But the people did not want that water. It all ended up a million or 2 million gallons of water being pumped to the ocean or San Francisco Bay every day.

BURIL: Is this Santa Clara?

YAMAMOTO: Yeah. Santa Clara. I think it was IBM and Fairchild Chemical. So that's an example where we're not going to go get in between telling people they have to take this water. Otherwise, we would probably be run out, our department would cease to exist or something.

So that's one of the things that whatever city or utility gets involved in receiving it, that's probably going to have to be part of what they're going to have to do as far as the program, is to try to do a PR program.

ROBLES: The utility.

YAMAMOTO: The utility and everybody else. You know, in this case if it's in the Raymond Basin, they probably should also help participate. We already have one reclamation project killed because they didn't do thorough publicity and some angry people got up there and killed the project. So those things can happen.

So that's one precaution I would warn

whatever. And so that the sooner you can identify, you know, where the water is going to go and the sooner you can work on that. And, you know, I presume, since this is a Superfund project, there's already a PR and so --

ROBLES: We have to do those things.

YAMAMOTO: -- you just probably need to expand that to try to, you know, point out the necessity.

ROBLES: Have public meetings anyway.

BURIL: Could you elucidate for me just a little bit about how you handle wells in the area of JPL or how you would think of handling the wells in the area of JPL.

Say we have like the Arroyo Well that is contaminated, and yet when you go a little further out you've got Lincoln Avenue, which really doesn't show much of anything in terms of perchlorate.

One of the more troublesome portions of this talks about having to treat the entire flow from the source. I guess the questions that I have relate to what do you consider "the source"? And when you talk about treating the entire flow, are we talking about the entire flow from individual wells or from the source overall from any well?

YAMAMOTO: It was intended for individual wells.

What some people wanted to do was treat part of the flow and then blend it to meet the limit.

BURIL: So a 2,000-gallon a minute well, split the flow and only treat half?

YAMAMOTO: Something like that.

VECCHIO: Right.

YAMAMOTO: Then we would say no, treat the 2,000.

BURIL: I see. So it's applied on an individual well basis as opposed to a basin wide.

VECCHIO: Right. Basin-wide cleanup for that.

YAMAMOTO: So in this case what would have to happen is -- you've done some of these. That is, we would want a source water assessment. It's identifying what has been contaminated, where the plume is and where it might also go, you know, so that what you've got to sort of do is, you know, sort of indicate what sources may be impacted.

Since this is for cleanup, then this policy will fly, even though maybe on an individual well it may not by its level of concentration unless it's somehow not pictured that it's part of the area. Like if you decide to draw like a containment well at Arroyo and so that it can't get to Lincoln, then we can exclude Lincoln. But you're going to

have to somehow convince us, yeah, it won't get to Lincoln's well.
ROBLES: Now, the key question, though, is, Gary, we've been focusing on our contamination --
YAMAMOTO: Right.
ROBLES: -- that emanates from our site because the site is the NPL site and anything that emanates from there. We've made it a statement, we've stated in minutes. When we set up remediation if we happen to pick up other contamination not from our source, for example, the PCE plume that's coming out of Flintridge, and we treat it with our system we're not going to say no, because you can't tell one molecule from another.
But the policy indicates that we have to consider other sources of the resource of that well. For example, the Arroyo Well is not just impacted with contamination that is generated from this site, but from maybe other sites. And so do we have to include that?
Now, we're going to include it. You know, the level comes out there, says perchlorate is this level. Whether it's all ours or not, we're going to shoot for that because our main goal is to get Pasadena back into operation. But if we have, for

example, a Lincoln well, all of a sudden we see a contamination there at the far end and we know it's not ours, what do we do?
YAMAMOTO: Well, I would expect whoever -- I don't know who is the lead on this project, EPA or Regional Board, that they would somehow address that plume -- I mean they will not go after just JPL, but they will go after everybody.
ROBLES: So I would have to go after other people's plumes that doesn't emanate from my site?
VECCHIO: No. The Regional Board would have to take action in terms of -- for example, you're going to have to pay for treatment.
ROBLES: Right.
VECCHIO: Okay. So there are -- you know, there's the actual treatment process. There's the O & M costs. Okay. If there is somebody else that is a contributor, you become a responsible party and you pay your cost. That is a job for EPA and it's part in the Superfund cleanup. Okay.
We -- what we handle is -- we don't care who contributed. Okay. All we care about is that the treatment provided is going to be reliable and that you're going to produce a safe water and that it's going to be delivered to customers. Okay.

So we don't get -- we personally don't get involved with that part. That's either EPA or it gets delegated down to the Regional Board or to Toxics.
ROBLES: What I'm getting at is, we know that there's major plumes that are coming here.
YAMAMOTO: Right.
ROBLES: So we would deal with that. But remember, some of the maps show there's a plume down here.
VECCHIO: Right.
BURIL: And there's stuff coming from up top.
VECCHIO: And there's stuff coming from up top.
YAMAMOTO: The only one I would worry about now is because you've got a commingling of the plumes is what's --
ROBLES: Is this right through here.
VECCHIO: Right.
YAMAMOTO: Yeah.
ROBLES: See, because I don't delineate. I'm not going to say I'm not going to treat anything coming off Las Flores, but if it gets to these wells and we have a treatment, we're going to deal with it because we can't distinguish.
VECCHIO: Right.

ROBLES: This down here, we can show that there is no connection.
YAMAMOTO: As long as you don't show there's a connection. I don't see one right now.
ROBLES: Okay.
YAMAMOTO: The only thing that might happen is if one -- let's suppose JPL has cleaned up their site, but the off-site, you know, from La Canada is continuing on. The question is, you know, JPL may say "Why should we continue? We've cleaned up our site." That's actually a concern of ours in task number 3, is that there needs to be some way that whatever the sources are, that they're somehow getting reduced. And so if something needs to be done -- if something hasn't been done for what's coming from La Canada.
BURIL: Let me ask you this, Gary. The upgradient sources, whatever they may be, in order to initiate a remedial action that utilizes, say, Pasadena wells or something like that, would it be part of the requirement for obtaining the permit that someone, whoever that might be, would need to go into La Canada and determine where those sources are prior to the issuing of that permit?
YAMAMOTO: Yeah.

ROBLES: See, the key area, Gary, is that CERCLA does not require us to get a permit. CERCLA says we have to meet permitted requirements through the ARARs.
YAMAMOTO: Yeah.
ROBLES: We don't purvey water.
YAMAMOTO: Right.
ROBLES: The purveyors of water would need a permit. But ultimately if they had to do this, they're going to come to us for help. And since we've done most of the work, we've done a feasibility study, we've done risk assessment. But then to expand it, this is where our problem is. To deal with the whole Raymond Basin, they'll come to us and say "Study the whole Raymond Basin." We'll say "We can't." That would be there.
Now, we would help in the sense that we would work with them to have a treatment system that handles this commingled plume because we're not going to delineate that. Like I said, if we happen to take anything else in the future, there'll come a time when we may say, "Hey, we've done our fair share." We'll still pay it. We'll have to work that out then. But as long as we're -- we'll put in the capital investment and everything else.

But the key question is what do we do up here? What do we do down here? And those people may come back and impact us because their comments have been "It's the government."
YAMAMOTO: Unless there is a direct correlation downstream, I would say there isn't, you know, and therefore -- but right now I haven't seen anything that tells me there isn't one, but the upstream. And you'd have to -- you know, otherwise, you know, you're going to be treating this forever.
ROBLES: Right.
BURIL: So in one way, shape or form, then, in order for NASA/JPL to initiate a remediation utilizing the water from the Arroyo Well and then supplying that to Pasadena, let's just say, for drinking water, that assessment of the upgradient sources would have to be complete and understood prior to you folks issuing the permit to the water purveyor to do what we're talking about doing.
YAMAMOTO: Yeah. Unless you've -- what you could have is, you could have this being done in phases. Okay. So that you could do the on-site in Arroyo with the idea you still got more time to -- you know, you need more time to go investigate the upstream. But that's still with the idea that

that's going to be part of the overall solution.
BURIL: When you say "phases," are you saying that we could initiate treatment prior to -- knowing that someone would have to go forward and do the remainder of the assessment upgradient, or would we have to have the phase of assessment done first, before the treatment?
YAMAMOTO: Enough of that just so I know. And then you may not have marked out exactly how you're going to deal with that, you know. Or you may not have identified all, or it may turn out if it's the septic tanks or whatever and your solution may be that the community needs to be sewered, in that case that is going to take time. And that may be politically difficult too, you know.
ROBLES: Because sometimes the solution may be beyond our scope. It's something that belongs to the municipality that we have no control over.
YAMAMOTO: Well, that's where Vera and I were mentioning that if it's the septic tanks, then that community becomes -- as far as I'm concerned, it's the responsible party and they've got to pony up their share of the cleanup.
VECCHIO: Of the costs. Yeah.
ROBLES: Two items. If water is given to, let's

say, like Pasadena, then they would need a permit. If water is not given to them, we just have a closed-loop system.
VECCHIO: What do you mean by a closed-loop system? Is that just injecting?
BURIL: Just reinjecting.
ROBLES: Reinject. What we were looking at --
VECCHIO: Because a closed system to me would be taking that water, treating it and using it on site.
BURIL: No.
ROBLES: We can't do that because it's adjudicated water.
VECCHIO: Okay.
ROBLES: What we were looking at, as we read the policy, was to have our own wells, new wells that we would put in here and have an on-site treatment and inject the clean water here and then pump it back out here and send it back through the system and keep doing that over and over again. So, therefore, we have at the end of the plume, so we would suck back up anything this way and keep control of the plume so there would be this area here.
BURIL: We would also influence the area to the east as well, Pete, because the radius of influence would reach out to there.

ROBLES: Right. And that's what we mean by "closed-loop system."
CUTLER: Can I just make a comment on that real quick? These four wells here, as you probably know, produce around 8,000 gallons a minute.
VECCHIO: Right.
CUTLER: And they have an area of influence, when they turn these wells on, we see 10 feet of drop over here.
YAMAMOTO: Sure.
CUTLER: So you get the idea. To have a dualing -- to try to dual 8,000 gpm to control a plume is --
BURIL: There's some technical impracticality there.
YAMAMOTO: Oh, yeah.
VECCHIO: The more plausible is to use this for a domestic purpose.
ROBLES: Right.
VECCHIO: We understand that.
CUTLER: I guess our big question is can this be used as wellhead treatment.
BURIL: They haven't said no to that. But what I'm hearing is that the requirements of the assessment of all of the potential sources has to be

complete before we begin doing any treatment of water to be used for a domestic source.
YAMAMOTO: One of the things we're going to need to know is right now, without having looked at these reports, we don't know to what degree, what chemicals you've analyzed for.
VECCHIO: There may be other ones you need to look for.
YAMAMOTO: And that's the concern. We don't want to like put in a treatment system now --
ROBLES: And come back later, oh, we forgot.
YAMAMOTO: -- and come back two years later, you forgot this compound. And the idea is the assessment is to identify all of those compounds, whatever they may be, hopefully so you don't find another perchlorate compound.
BURIL: Can you explain just a little bit about -- I've heard the term "grandfathering" of this policy in dealing with certain wells that are already being treated for things. That came up at the Raymond Basin Management Board.
VECCHIO: Existing treatment systems.
BURIL: How does that work? What exactly is that function?
YAMAMOTO: Because we already gave them a permit

for that treatment system so we can't like, you know --
VECCHIO: Just go back and say "Hey --"
BURIL: And say "We have to take it back"?
VECCHIO: Yeah.
YAMAMOTO: "You lost your permit."
However, what happens if something goes wrong, that well gets shut down for something else, like perchlorate. That's what happened with La Puente. Now if they want to reactivate they've got to take care of the perchlorate or go to public notification. Now we caught them in this policy.
ROBLES: Does La Puente have a permit yet?
YAMAMOTO: No. In fact, they haven't completed all of their demonstrations yet.
BURIL: Are they going to be required to complete that same assessment?
YAMAMOTO: Yeah. Yeah.
VECCHIO: Absolutely.
YAMAMOTO: In fact, what they have is Stetson trying to do one sort of over the whole San Gabriel Basin and then put in one especially for their site.
VECCHIO: You understand we already have operable units in place. We have the Burbank operable unit. Glendale is proceeding through the

process. They're doing their assessment at the moment. Then there's going to come a time for the public hearing.
BURIL: Are you using "operable unit" in the same context that we use "operable unit" in the CERCLA?
YAMAMOTO: Yeah. That's where the term comes from.
VECCHIO: Yeah. It's the same thing.
YAMAMOTO: It's a CERCLA project.
VECCHIO: It's where contamination is identified, responsible parties identified. You have a consent decree, deal with ARARs. You make the determination of who's going to get this water or where it's going to go. Then you go through the permit process and this particular process with us. It gets designed, built, constructed, and then it gets operated and gets to the customers with some pretty heavy duty monitoring.
CUTLER: Based on your experience, you mentioned public perception could be a show stopper.
VECCHIO: Absolutely.
CUTLER: Based on what you've seen --
VECCHIO: Hasn't stopped Burbank. Hasn't stopped Glendale.

YAMAMOTO: Well, we didn't hold a public hearing for Burbank and we haven't held one for Glendale.
VECCHIO: For Glendale yet.
YAMAMOTO: What I did on Burbank, it may not have been the right decision, is EPA held one, a public hearing, very early in the process, even before they even started construction. And there was -- of course, nobody objects to it. It was about four or five years ago and the thing only was built two years ago. But after the construction, then some of the people, citizens, started complaining about it.
ROBLES: So you required another public hearing?
YAMAMOTO: Yeah. So that probably in hindsight, because actually our -- my permit wasn't issued until they finished construction and I could have held a public hearing and who knows what might have come out of the woodwork. It probably still would have passed anyway.
VECCHIO: See, the thing that Glendale learned from Burbank is the general PR. There's a lot of PR going on. There's a lot of public meetings. There's a lot of information being passed. EPA also gives out bulletins on a periodic basis. But it's a highly visible -- it's a highly visible project.

And we have 5,000 gallons per minute.
ROBLES: Right.
BURIL: It's a lot of water.
VECCHIO: It's a lot of water.
ROBLES: I took this back to our legal people back in NASA headquarters. The glitch in this, and I will be quite frank with you, we do not view this as an ARAR.
YAMAMOTO: Yeah. No. We actually -- our top level people have met with your top level people, and we agree. However, we have the final club if we could deny permits to anyone you deliver water to.
ROBLES: Exactly. That's where your --
YAMAMOTO: That's where it falls.
ROBLES: The problem with the policy is that it doesn't comply with the NCP and CERCLA in one very critical thing. Public involvement in CERCLA is not the final decision. It is one of the major inputs in what is going to be decided. It is the lead agency, EPA, where in some cases they have gone and said we have taken your concern, John Q. Public, for the good of the environment and the community and public health, we have to take this. Your policy makes it that the public is the final determination.
VECCHIO: If you use it for domestic water.

ROBLES: Right.
VECCHIO: If you used it for injection, we wouldn't get involved with it because it's strictly being injected. Then what we would have to do is deal with Pasadena on their issues.
YAMAMOTO: Well, we would get involved.
VECCHIO: On their issues in complying with the standards. We get involved with reviewing it and making comment for the Regional Board. But once it becomes a potable water supply for the customers, we're the bottom line.
ROBLES: Right. See, but under a CERCLA, the Santa Clarita scenario would never happen.
BURIL: Santa Clara.
ROBLES: Santa Clara. But under this, that can happen.
YAMAMOTO: Yeah.
ROBLES: That's the disconnect.
YAMAMOTO: Well, we're under too much political pressure.
ROBLES: I understand that. That's why we've taken the course we have to. Even though it may not be ARARs, we have to consider the impact. If the water is going to be used for domestic, we have to take this into consideration because ultimately we

have to work with that purveyor of water. And if they don't buy into it, the whole program is falls anyway.
YAMAMOTO: Yeah. Well, part of that is the water purveyors are now getting nervous. I don't know to what degree in this area, but our office is -- constantly people are going through our records on water systems and et cetera. And some of them are attorney groups representing environmental groups or whatever.
ROBLES: Special litigation cases?
YAMAMOTO: Yeah.
VECCHIO: Yeah. Lot of them.
YAMAMOTO: And they may be, certainly, gathering that with the idea of showing up en masse -- well, not en masse, but certainly organized to oppose whatever. And so I suppose --
BURIL: We talked about reinjection a little bit. Does this policy have an effect on reinjection?
YAMAMOTO: No. We would review the reinjection on a case-by-case basis. And it's just to protect whatever we think the groundwater basin is going to be used for. So we certainly would not condone any, you know, reinjection of something that's above any

of our MCLs or action levels.
BURIL: Sure.
ROBLES: But if the reinjection is clean water --
YAMAMOTO: Yeah.
ROBLES: -- and we inject it --
VECCHIO: Right. Right. Because, you know, we review the Regional Board permits. Because you would get a Regional Board permit to do this because then they would require a cleanup level, and then where you would inject it. We normally review these and make comments to the Regional Board.
BURIL: Okay.
LOSI: How about biologically treated water, with regard to reinjection?
YAMAMOTO: Yeah, well, it raises up some other issues. As long as it's properly handled, yeah.
CUTLER: As long as it meets the criteria, as long as it's clean enough you can reinject it?
YAMAMOTO: Yeah, so it's cleaned up enough so that now you just make sure there isn't some biological or byproducts that may affect the groundwater.
BURIL: So appropriate disinfection would be sufficient to comply.

YAMAMOTO: Yeah. Probably.
BURIL: How about surface discharges?
VECCHIO: That's another Regional Board thing.
BURIL: You folks wouldn't have this policy trigger or be involved in that per se?
YAMAMOTO: No. In fact, the Regional Board does have tighter requirements than we think are necessary. Because on some of them we don't think you need to meet drinking water standards because --
VECCHIO: You have a real problem --
YAMAMOTO: -- the surface stream would clean it up.
VECCHIO: -- with discharging, because of the fact that you have a water rights issue. Okay. If you're injecting -- I'm sure there's probably some water rights issues involved. However, you know, you're taking and you're putting back in.
BURIL: It's zero sum.
VECCHIO: Right. Zero sum. Right. But if you're going to discharge it above ground, then you're going to get into some water rights issues.
YAMAMOTO: Unless it's all diverted and put into the spreading basins.
BURIL: That's just a thought that came from the City of Pasadena.

YAMAMOTO: Sure.
BURIL: We weren't sure exactly how this would actually play into that.
YAMAMOTO: It's more for (UNINTELLIGIBLE). But then in the basins you already have mosquito control or vector control.
VECCHIO: See, normally on the recharge you only get like a percentage of it. You only get a percentage for recharge. And then during the rainy season you only get like a 20 percent air credit. So again, it's another water rights issue.
BURIL: Yeah, there's a water rights issue.
VECCHIO: It's a water rights issue.
YAMAMOTO: Deal with the Raymond Basin.
BURIL: This was a suggestion that came from the City. I think they were thinking about their Hahamongna Park development and how that would all come together.
ROBLES: To use the water that's generated for the Hahamongna.
BURIL: It's not something we either accepted or put aside, because we're just not sure.
VECCHIO: But, see, there's still another issue that has to be resolved and that is, yeah, you're going to put in your treatment system, yeah, you're

going to put extraction wells in, yeah, you're going to stop movement of this water. However, there has been movement. Okay. So City of Pasadena still has to deal with the issue that they have 140 or 150 parts of perchlorate in Arroyo Well. They can't adequately treat at the moment by blending. Okay? So there may be X number of years before there's actual cleanup. So that they have to deal with that issue at the moment. That's 8,000 gallons a minute. Okay?
BURIL: Yeah.
VECCHIO: They come at you pretty heavy for dollars for replacement on that. So probably the more viable issue is for domestic purposes that we've got to go through this.
CUTLER: About how long do you think getting a permit would take?
VECCHIO: Well, first -- okay. Can I tell you the typical length of what we've gone through on like a Glendale OU? It's been a three and a half year process.
ROBLES: Mark, did you say something? Did you cough? Did you choke?
RIPPERDA: I gasped. Yeah.
VECCHIO: Let me explain to you why it's been a

three and a half year process. It's because of the RPs. Okay? It's the identification, the contribution, what their percentage is in terms of money for cleanup. There was Dreamworks that came in and messed the whole thing up because they wanted the site that Glendale -- that they were going to put the treatment facility.

RIPPERDA: So that may not actually be a good example because we don't have --

VECCHIO: Well, that's all I could give you, guy.

ROBLES: So it only takes us one and a half years.

RIPPERDA: Do you have a permit application package that you expect to see like more than what's in this policy?

VECCHIO: Okay.

RIPPERDA: How does JPL go about applying for a permit if they wanted to?

VECCHIO: JPL would never apply for a permit.

YAMAMOTO: They can.

VECCHIO: Unless you want to become a water purveyor.

BURIL: No, ma'am.

ROBLES: We cannot.

YAMAMOTO: If they treat the water, then it's a question of who's treating the water.

RIPPERDA: Right. If JPL is doing source control on site so they drill their own well, they do their own treatment and then they give the water to Pasadena or sell it to Pasadena, would Pasadena then apply for the permit?

YAMAMOTO: Yeah, in addition to JPL.

BURIL: If we were to supply Pasadena the capacity for treatment through some agreement with them, but they would operate it and support --

VECCHIO: If they operate it, then they would get the permit.

YAMAMOTO: Yeah.

VECCHIO: It becomes an --

YAMAMOTO: See, I need control over the people who are operating the plant.

ROBLES: See, in most cases we would -- like, for example, with the Calgon system, we pay for it, but basically Pasadena says, "Okay. This is how we want it done." And so they control the way to operate it. We're just paying for it.

YAMAMOTO: See, in the case of Glendale, the City was not a responsible party so they weren't, supposedly, involved in the treatment whatever, and

it was the respondent's group. But they didn't want a permit themselves. So what finally had to be negotiated is for Glendale to assume -- Glendale literally was kicking and screaming into the process because they initially did not want to have anything to do with operating. But we told them that's the only way we're going to accept it. You know, somebody had to give, either Glendale operate it or the responsible parties get a permit.

ROBLES: See, for us, I would prefer that, not for ulterior motives. It's easier to have public meetings with Pasadena Power & Light being the one saying "We're getting the permit."

YAMAMOTO: Right. They're going to operate it.

ROBLES: "And we've got NASA and they're going to do this and we're going to make them make sure," and so on and so on. And we stand up there trying to get a permit saying "I don't buy water from NASA."

YAMAMOTO: My understanding is the Glendale responsible parties are the ones that are designing the system. Right?

VECCHIO: Yeah. They're paying for all the costs.

YAMAMOTO: Costs of the design and everything.

VECCHIO: Just like you will pay for the costs of the design. You will pay for the installation and the operations --

YAMAMOTO: There is also costs to Glendale for operating the system, too.

VECCHIO: -- of the system.

ROBLES: See, basically Pasadena says "We don't want you to build it. We want you to lease it." So we had to do what they told us to do. That's what the Calgon system --

BURIL: They basically wanted a zero cost to them.

ROBLES: So we lease it. We pay the maintenance. They basically are in charge of it.

YAMAMOTO: That's fine.

VECCHIO: That's fine. We don't have an issue with that.

BURIL: Okay. With regard to the CEQA requirement that's in this, how do you folks coordinate that with CERCLA efforts, given CERCLA efforts are exempt from NEPA/CEQA and the policy?

ROBLES: Because they meet NEPA/CEQA requirements. There's been court cases.

YAMAMOTO: It's just whatever it takes for us to issue the permit to Pasadena, because Pasadena is

getting this water, or whatever.
BURIL: So --
YAMAMOTO: In order for us to issue a permit we have to comply with CEQA.
BURIL: So if Pasadena is going to get the permit, they've got to comply with CEQA irrespective of the CERCLA effort that's impacted by this.
YAMAMOTO: Right. Yeah. And it could be very simple or whatever, depending on what's involved.
ROBLES: Because our view is that when they get a permit they'll have an attachment which is our administrative record.
YAMAMOTO: Right. Okay.
BURIL: You don't want to go there.
ROBLES: A small document like this with a huge room coming right behind it.
YAMAMOTO: It's all right. We've got I don't know how many bookcases of stuff from Burbank operable unit.
VECCHIO: And we've got shelves and shelves for Glendale operable unit.
BURIL: So as far as the public input to this, then, is there any issue with coordination of CERCLA and CEQA-required public hearings or your policy public hearing?

No.
BURIL: We can do all of these together if we went that way?
YAMAMOTO: If you went that way. But I don't know. Because I presume that the CERCLA hearings are way up, way earlier than we are.
VECCHIO: Right.
ROBLES: It's a lot easier to distinguish from the fact that Pasadena was getting a permit to say this is a public meeting for us to get a permit so that we can get the water (UNINTELLIGIBLE) --
YAMAMOTO: Right. That's what it would be. Not this project.
ROBLES: Never mix the apples and oranges together. You don't get fruit. You get mush.
VECCHIO: That's about right.
BURIL: Let me try to play this scenario out for you in my own head here and see if it would hold any water, so to speak.
What I'm thinking right now is that if we went forward with a feasibility study and said that we wanted to have, let's say, the Arroyo Well pump water, contain the plume, we're going to treat it, we're going to give it to the purveyor, who would ultimately -- basically, not we, but they would be

running the plant.
YAMAMOTO: Right.
BURIL: And we would be financing that. We would need to get your permit to do that, which would require all the assessments that are outstanding be completed prior to that permit.
Then we would also be in the position at that point of going to the public with this plan prior to the permit being issued, in which case we would have opportunity to have the public say, "No, we don't want that to happen" and we're back to ground zero as far as what we were going to do on a feasibility study.
Is that a fair characterization of where we're at right now?
ROBLES: Worst-case scenario would be, Chuck, that we would shut down the Superfund program and just say we're going to buy water.
BURIL: Well, yeah, there is that opportunity. I just want to be sure that that was the kind of scenario that we were dealing with because it draws into question a number of things that we were thinking of doing, and certainly the approach that we had been taking up until now is going to have to be a little bit different, at the very best.

CUTLER: What it sounds like can happen, though, is almost that whole scenario, except for the very end, instead of that water going to a drinking water source it just gets reinjected.
BURIL: Yeah, you can reinject. Of course, then there are questions that go with that in dealing with the Raymond Basin Management Board and whether they would accept that as a remedial action under CERCLA.
ROBLES: Because their ultimate goal is to get the wells back in production.
CUTLER: It may be forced to do something like that until -- if it's three years before you can get a permit.
ROBLES: But I cannot --
VECCHIO: I just say that's our experience to date. That doesn't mean that that -- there's other operable units going at a fairly vigorous pace. And that's -- they thought they were going at a fairly vigorous pace, and that was the MTBE issues at the §Shawnark and Arcadia sites out in Santa Monica, because they're going essentially through the same process. The companies, the oil companies agree that they have caused the contamination, they are going to clean it up. You know, there's the whole

process that they're going to go -- that they're going through there, and they're also going through this assessment.

They thought that they would probably be on line with some treatment system by this time, and that's -- this is like a year later. So -- but that's another issue.

So it all depends. There's a lot of extenuating factors and I'm just telling you what our baseline has been to date.

BURIL: Okay. That's fair.

VECCHIO: Okay? So it's anywhere from a year to three.

BURIL: Or more, depending.

VECCHIO: Depending, yeah.

RIPPERDA: Can I say a couple things about like the feasibility study?

BURIL: Sure.

RIPPERDA: You had said a few minutes ago that you pick a preferred alternative and if you don't get the permit, you throw it out.

That's not probably quite true. Just from EPA's perspective, when you do the feasibility study, you list your preferred alternatives and, you know, probably the first one would be treating the

City of Pasadena wells and using it for municipal water and then you would have other alternatives, including something where you're treating on site and reinjecting on site with no municipal use at all.

So if you go with the number one alternative and you would have to apply for the permit before you ever sign a ROD because you wouldn't want to sign a ROD if you're not going to end up with a permit. So you would just have to put the ROD on hold until the permit determination is made by DHS. And if they decline the permit, then you would go to the second alternative without redoing the FS. You can just go to it and that's how the ROD would be signed.

But if the second alternative was ridiculously expensive compared to the first, at that point EPA might say, well, your first alternative is valid, it's protective of human health and the environment, you know, it meets all the requirements, the second alternative is ridiculously expensive, at that point we might say, well, we're not going to make you do the second one. You know, if local politics or something is keeping you from doing the common sense approach, you know,

we're not going to make you do something that's ridiculous. If it's only a little more expensive, than, yeah, we would make you do it.

BURIL: Okay.

ROBLES: Therefore, Mark, you're saying that the scenario would be if we couldn't get a permit or if the purveyor of water that we were trying to work with couldn't get a permit, then basically the project is dead.

BURIL: Well, no, you have a prioritization.

YAMAMOTO: Or you may try some other purveyors than your Raymond Basin to give the water to.

BURIL: Let me ask a question, Mark. This sounds like in the feasibility study that there is either an outward or tacitly presumed priority of alternatives in terms of --

RIPPERDA: Right. Given the uncertainties, you would have to like in your feasibility study present it as, you know, preferred alternative number 1, then 2, then 3. You know, rank them with a little bit of, you know, "if then" type of selection criteria for moving on to the ROD.

BURIL: I guess this is kind of an interesting segue to one of the next points on my agenda. I'm not sure what other questions people have with

regard to DTSC -- or excuse me, DHS' policy. Most of the answers I needed I think I got.

Mark, Mark, Vitthal, you guys --

LOSI: I got one question. You said that if we -- if JPL were to implement, say, a perchlorate treatment on the Pasadena wells that they will have to go through this process, which could take X number of years. Okay.

My question is if JPL were to do something aside from the purveyors, as Peter was suggesting, and reinject the water rather than provide it to the, say, City of Pasadena, for example, is the City of Pasadena then subject to this memo, or can they proceed as they've been?

VECCHIO: No. They're not subject to this memo. But the problem is that they still have wells that have perchlorates.

LOSI: Right. But they're currently producing.

VECCHIO: No, they're not. They've got a well out of service.

YAMAMOTO: If they were to reactivate the Arroyo Well, they'd have a problem now.

LOSI: What if they were not to? I'm just asking the question.

HOSANGADI: What if we were to have a well in

close proximity to the Arroyo Well?
LOSI: Or use the Arroyo?
HOSANGADI: Or use the Arroyo well?
YAMAMOTO: If they use the Arroyo Well, then they're subject to this policy.
HOSANGADI: But not use the water for drinking.
BURIL: In other words, we would take the discharge from the Arroyo Well and reinject it.
YAMAMOTO: Then you have to --
VECCHIO: You'd have to work out a deal with Pasadena.
BURIL: But it would not have a permit impact, per se, with you guys?
VECCHIO: Yes. As long as you don't use it for domestic water.
LOSI: Just to finish. There would be no issue with the permitting involved to produce as they are now, current production.
YAMAMOTO: Yeah.
BURIL: With the remaining wells.
YAMAMOTO: Yeah.
LOSI: Thank you.
VECCHIO: 52 is up to like 40 right now. Right?
BURIL: Right.
VECCHIO: I think there's stuff in Ventura and I

think there's stuff in Windsor. Those all blend together. So I don't know if they're going to be able to blend.
BURIL: I hadn't heard of Windsor going up. I heard Ventura began to have some.
CUTLER: Our thought is the reason that's happening is because the Arroyo Well is off.
VECCHIO: It's off and it's migrating.
CUTLER: And once that gets back on --
VECCHIO: You think it's going to pull it back up again?
CUTLER: It will protect those wells. Kind of look at our plume maps. That plume is kind of like shifting south. It's following the production, obviously. So obviously, I'm sure these guys feel the same, we certainly don't want Well 52 to go off because then it's in the same boat as the Arroyo Well --
VECCHIO: Right.
CUTLER: -- and the City won't be happy.
ROBLES: So when the Arroyo Well was on, the other wells were okay?
BURIL: For the most part, yes. It wasn't until the Arroyo went down and things started shifting south.

CUTLER: If we were to put an extraction well for cleanup, the Arroyo Well is a perfect spot. Either that or the Arroyo Well pulled the plume right to it, is probably what happened.
So it couldn't be any better to use that well either for treatment or -- for water or for treatment and reinjection because it's perfectly placed. The plumes are probably going right to those screened intervals. You put in another well, you'd probably try to mimic those screened intervals because it's kind of scattered. It's ideal. And we think it will protect the plume from migrating south. You can crank that up 1,000, 2000 gpm like it was doing before.
BURIL: It would help. That's the thought process behind it.
CUTLER: Right. There again, speed is a plus because if Well 52 goes down --
YAMAMOTO: Then it goes further, you may not be able to pull it back up.
CUTLER: It may be one to three years before you get it back on.
VECCHIO: Yeah. I can see where this would be leading and the City of Pasadena would come in and say, "Okay, you give me another well now. You're

going to have to pay me for the loss of my water rights and pumping rights on that."
Trust me, there's going to be some heavy negotiating.
BURIL: We're anticipating that already.
VECCHIO: Yeah.
BURIL: Okay. Any other questions on the policy part of this?
CHRISTMANN: I had a couple of thoughts, Chuck.
BURIL: Yeah, Craig.
CHRISTMANN: On your potential use of those production wells, you're not sure of the distribution of contaminants in those wells. I would suggest that you examine the feasibility of packer testing those wells and looking at exactly what's being produced from the various screens so you can optimize your extraction there.
BURIL: We've actually talked to Pasadena in kind of cursory terms about doing just that.
CHRISTMANN: The other item is that we are working with EPA and looking at those upgradient sources for the PCE.
BURIL: That's good news.
CHRISTMANN: That's probably next fiscal year that that's going to happen. But we're trying to

pursue that.
BURIL: Good.
CHRISTMANN: I think we've gotten a little money from EPA to spend money on that.
BURIL: Great. Well, job security. Right?
Okay. Having exhausted the questions at least for the time being on the policy, then, I'd like you folks to stick around, if you could, because what I'd like to talk about next is with regard to how we might want to phase our FS efforts here. Having your comments as far as how things have worked at other locations and things might be of some benefit.
In trying to figure out how we were going to deal with the policy and then how we were going to deal with providing the deliverables in the CERCLA effort, we came to a conclusion that we probably are not going to be able to get all the answers all at once. And I think that's become painfully obvious as of our meeting today, that there are portions of this which could be somewhat protracted in terms of getting things together.
And so what I was going to propose to our RPMs was that we phase this type of approach on the FS to deal first with getting through you folks,

okay, the regulators, find out what it is that we have to deal with in terms of the ARARs, get everything resolved in terms of working with you folks as the regulatory agencies.
The second phase, then, would be to take those particular alternatives, ones that we have already worked with you and understand what the requirements would be, and then go to, say, other entities that we would be involved with in order to establish that particular remediation. Case in point, go then to Pasadena and say, "Okay, folks, we have worked this through and we have our list of prioritized alternatives. The one that came to the top is with you folks. And we need to work with you. We've already worked the issues with the agencies, so we understand what their requirements would be. We would now like to sit with you and understand, one, if it's even feasible at all from your perspective, and then what your requirements would be in addition to the regulatory agencies'."
Once we have that understood and if, indeed, we end up dropping certain alternatives out as a result, fine. We don't know. We would have to cross that bridge when we get to it.
But whatever survives that second phase

would then go to the last phase, which would be whatever requirements we have in terms of proposed plan, public meetings and so forth to finish off the CERCLA aspect of things. And then if the DHS policy requires additional stuff in order to obtain the permit, we would try to build those into our overall approach and schedule as much as we could, but recognizing that we would be pursuing these things concurrently, and thereby hoping to keep the time frame down.
But it seems to me at this particular point that we don't have the ability to have all of the answers to make the best selection in all cases right now. We just don't know what the City of Pasadena is going to say to the alternatives. We don't know what kind of impacts Gary's organization may have on some of the alternatives. And taking this in a more stepwise progression I think is the best way we can go.
So my suggestion at this point is to simply say that the first FS, and I say first FS that you folks get, would be one that we would recognize has been worked within JPL/NASA and the regulatory agencies but does not take into account working with the bodies that would ultimately play

with us, say, Pasadena or Raymond Basin or others, but that we would then go forward once we've resolved our own issues internally, then move to those folks, issue whatever reports, addenda or whatever would be necessary in order to document the decisions of that process, and then finally into the proposed plan, public hearing, and so forth from there.
ROBLES: That's a good idea.
BURIL: How does that sound in concept to people at this particular point?
YAMAMOTO: Is there a reason why you don't want to maybe call in Pasadena and Raymond Basin sooner?
VECCHIO: First?
YAMAMOTO: Sooner?
ROBLES: Because they cloud the issue from the standpoint of we want to know what the regulatory agencies want first. Then we take that to them and say --
YAMAMOTO: Or maybe not discuss the whole issue, but at least discuss the issue of the acceptability of whether they would even take the water.
VECCHIO: Take the water.
YAMAMOTO: Because why spend all that time going

down that path if they're going to say no.
BURIL: That's a reasonable thought.
YAMAMOTO: Maybe just deal with that particular issue, not all of the issues.
VECCHIO: And the only way that I can actually deal with any of these projects is that we have a billable program. And in order for me to bill and even work on any of these projects, I have to have a water agency to attach it to. So we can set up a deal where City of Pasadena gets billed for this and you can pay Pasadena for this. But I need to have a water system that you're going to associate with up front.
CUTLER: I think, too, what Chuck is getting at is of those nine criteria that EPA sets out for FS, one of the last ones is community acceptance. That's something we probably won't know until way down the road. Either we go through a permit process or the public meeting process for CERCLA. And so we may have to build in the -- make the assumptions, well, maybe the community will accept it, wellhead treatment for drinking water, or they won't accept it, maybe we'll have to reinject. So I think what you're getting at, Chuck, is we may have to carry those things through not knowing the answer

from the public. Then they come down at the last second and say "I'm not drinking that."
YAMAMOTO: I'm not talking about the public. I just mean whether the water system will even accept it.
BURIL: Even consider it.
YAMAMOTO: They won't even bother. They may say no. The community may say yes and the water department says no.
BURIL: That's why I was breaking it down in the phases that I've mentioned. Your point is well made as far as what we might want to do at least in understanding whether they even want to talk to us about that.
I'll share with you that the Raymond Basin and City of Pasadena both already made overtures to us that, yeah, they would be very interested in making those kinds of agreements.
YAMAMOTO: Okay.
BURIL: So from that perspective, I think that we probably are a little further along than what you are already aware of. But we have not gone into detail as to what their anticipated requirements would be and their demands would be if we were to try to formalize this. That's the aspect that I'm

saying that we would not broach --
YAMAMOTO: Right
BURIL: -- until after we had worked the internal issues with all the regulatory agencies.
YAMAMOTO: See, I would want to, from our standpoint, make sure Pasadena has a clear understanding about the permit issue with them and that they're expected to be totally responsible.
BURIL: That would be the thing that I would say that we would go to them and say, "Okay, folks, this is what we want to do, but understand what Gary's organization is telling you, is that it's going to take this, this, this, and this, and what are you going to expect from us if we enter into this approach?" That's the thing. I want to understand all the agency requirements and then work with the other folks so that they understand them, too, and then we can come to agreement to either do or not do.
Does that sound like a feasible approach based on what you've heard so far?
YAMAMOTO: Yeah.
GEBERT: Yeah. Does to me.
BURIL: Okay. Well, I'm going to proceed in that fashion, then, because -- boy, this just got

really complicated. It was complicated to begin with, but it's even more complicated now. That's not meant to be pejorative toward you folks. It's something we've got to deal with. It will be interesting to see how it works.
RIPPERDA: So, Chuck, what's the schedule for the FS?
LOSI: Three and a half years.
BURIL: Well, okay, Mark. You ask a wonderful question, one which I'm not sure I can answer well right now. But let me --
ROBLES: Or want to answer.
BURIL: Or even want to. But let me tell you that at the last telecon that we had, I did indicate that we were going to be putting a proposal together to extend the FS schedule to deal with treatability studies that we wanted to do to try and find a more viable alternative for treatment of perchlorate.
RIPPERDA: Yeah.
BURIL: That schedule extension is basically four months to get all the treatability tests done, get it into the FS and build it into the overall evaluation of the things that we want to do. The proposal is sitting on my desk. Pete gave me the thumbs up last Friday to move forward on it. So we

are planning to do so and I hoped to have a letter for you here today, but unfortunately my computer died on me and I don't have the letter.

But we're looking at right now a four-month extension from what it's currently scheduled at. And that would get us to the point of having all of the what we consider feasible alternatives established that we would then turn to you folks with.

Now, Mark, one thing I want to check with you on. Are we talking about wanting in the FS a prioritized list of alternatives based on what we're hearing here today?

RIPPERDA: That's what an FS usually does, or almost always does.

BURIL: Because I've had some discussions with my consultants that were somewhat contrary to that. That's why I wanted to find out.

ROBLES: Consultants are contrary anyway.

RIPPERDA: But I would want to keep the FS somewhat simple because there are so many long-term variables. I agree with, I think, what you said a few minutes ago, where the FS should state that some of these alternatives have some things to work on. But I wouldn't worry about them in the first draft.

The first draft of the FS I just want to see the technical feasibility and the cost data.

BURIL: Right. And that's what we're trying to generate. We have a lot of it for everything that we've done so far. We've got these bio-treatability studies that we want to do with -- well, you'll see this. Basically it's dealing with RO and bio-treatability that looks to be far more effective in terms of cost than anything we've seen to date. And that's a big player in this because when we start talking about the other alternatives, the costs jump rather dramatically. We're in the 25- to $30 million range otherwise, and we're hoping to cut that back rather significantly.

ROBLES: Yes.

VECCHIO: That ISEP one is 25 to 30?

ROBLES: Catalytic system.

BURIL: With everything together, yeah.

VECCHIO: With the --

BURIL: With the catalyst system.

ROBLES: It can eat up the whole environmental NASA budget in one gulp here.

BURIL: That's why we're struggling with this. We had hoped that the Calgon folks would come in with a more reasonable cost estimate. They have

actually done a fabulous job for me in trying to whittle that cost down. They're examining other potentials for bringing the overall cost down, including things like lease agreements and things of that nature.

But this is a brand new area for them, too. They've never done this with this kind of system.

VECCHIO: 500 gallons a minute?

BURIL: No, no. This is 4,000 gallons a minute.

VECCHIO: 4,000 gallons a minute.

BURIL: A $10 million capital cost and about a million and a half a year to run it.

ROBLES: You want a Mercedes with or without the engine?

VECCHIO: Usually with.

BURIL: So we're in a position of seeing that as the alternative right now. And some of the other alternatives that we have information on are nearly as costly. And so we're desperately looking for something that is more in line with what NASA would like to be able to spend and is also acceptable to the regulatory agencies. This treatability portion of it appears to be the silver lining. We just don't know how silver it is until we actually do the

tests. And like I say, I'll be getting that out to you tomorrow.

So my current thought is that we would be, for the first go-round of the technical evaluation and ranking of the alternatives, we would be about four months beyond what's currently on the schedule.

Then subsequent to that, we would have to build into the other phases of the FS, we'd have to build those into the schedule because currently those are not in there. And that would change things as well. We would have to sit and talk about exactly how that happens. I've only conceptualized the steps. I haven't conceptualized how long the steps would take at this point.

ROBLES: Does that answer your question, Mark?

BURIL: Does that help answer it?

RIPPERDA: Yeah.

BURIL: All right. Well, I will proceed, then, on the FS phasing as I've described, and I will get that memo out to you folks with the proposal. Once we can take that step, assuming that there's no problem with that, and I'm not making any assumptions here because I've heard no agreements from you folks as far as extending the schedule, but making that assumption that that ultimately is

approved, I think that we would then all want to sit down and just understand what the steps are for the next phase and get some understanding of what we have to do in order to get that together and make it happen.

Like I said, I have not gone that far in my conceptualization of this so I can't really give you any idea at this particular point.

Okay. The last thing I have on my agenda here is with regard to TEG. TEG is the company who does our soil vapor analyses.

One of the things that has come up with regard to TEG has been an investigation that has been undertaken by the NASA Inspector General. It centers around an allegation that the company had falsified some results that they had provided to a government agency. Without wanting to go any further into it because of the investigation, it brought considerable concern to me with regard to what it is they've provided us.

Based on all the work that we've done so far with our own data validation efforts and verification efforts, we don't believe we have a problem with the data. And, in fact, the individual who was involved with the alleged fraud, I guess is

what you could call it, did not participate in the development of our data whatsoever. Everything looks fine from our perspective, but what we would like to go ahead and do is to have a separate soil gas firm come out and simultaneously sample with the subsequent company of TEG. Currently we use a company called HP. What is it? HP what?

B.G., do you remember?

RANDOLPH: It's Hartman Perkin.

BURIL: They're the folks who basically took what TEG started and kept going. TEG is a company that no longer exists.

But we would like to go ahead and have a separate company come out and just split sample.

RANDOLPH: TEG is still a division of HP and they go under their own logo.

BURIL: Oh, really?

RANDOLPH: That's what I explained before. But all the invoices all go to HP.

BURIL: But anyway, this is in an effort to be sure that the data that we are getting is good and that we would hopefully resolve any concerns that might come up as a result of having used TEG previously. I wanted to pass that along to you, open it up for any comment that anyone might have

with that in mind and see what you think of that idea.

CHRISTMANN: How much were you going to have them, this other company --

BURIL: 100 percent duplication. Every sample TEG does we're going to do with the other company.

GEBERT: What's the name of the other company?

BURIL: Don't know yet.

RANDOLPH: There are several out there. But one clarification. They didn't falsify results. It was a calibration. And it was not for a government agency.

BURIL: Thank you, B.G. I misspoke. Thank you for that correction.

GEBERT: That also happened three or four years ago. It's an old incident.

BURIL: It's been a while. The need for the investigation is something that I have no knowledge of. And I don't want to speak any more about it except to say that this is going on and you folks should be aware of it and we're taking this particular action to help allay any concerns that might be brought up as a result of TEG's involvement in the past.

ROBLES: What do you guys think? Good idea?

GEBERT: Good idea.

CHRISTMANN: It answers any questions you may have. I think 100 percent is an awful lot, but --

ROBLES: Because this business is about data.

BURIL: You know what, at this point I would rather have absolutely no question by doing that than to leave any doubt.

CHRISTMANN: Yeah.

BURIL: I appreciate your thought, though.

That's everything I have on my docket.

Oh, excuse me. You know what, I have DTSC comments on OU-2 that I've skipped for some reason.

Unfortunately I did not bring those with me. B.G., have you got those with you?

RANDOLPH: I have a copy.

BURIL: Was there anything that you wanted to bring up on this? You're the one who is writing it. So why don't you ask the questions that you want to ask and see whether --

RANDOLPH: Does anybody else have a copy?

GEBERT: I forgot to bring mine.

BURIL: I did not bring mine, I'm sorry to say.

I tell you what. What time is it, B.G.?

RANDOLPH: It's about eight minutes to 3:00.

BURIL: If we take a ten-minute break maybe we

can generate some copies, come back and just talk about this.
Gary and Vera, if you folks want to hang around, you're more than welcome. Otherwise, we'll probably turn you loose before the traffic gets bad.
VECCHIO: What's OU-2?
BURIL: OU-2 is the on-site sources. OU-2 is basically everything that's vadose zone here on the site. So it does not directly involve groundwater. Of course, it does have some influence on it ultimately.
YAMAMOTO: Right.
BURIL: This is just basically the characterization of what we think were the sources of contamination that ultimately ended up in the groundwater.
VECCHIO: You know what I'm going to need, Chuck, because I'll be the person working on this OU, is actually the name of who the EPA contact is, phone number, Regional Board, Department of Toxics, all of the people involved, and then the people in your agency.
BURIL: Okay.
VECCHIO: So that I have those at hand.
BURIL: Not a problem. I have a list that I can

e-mail to you right away. Do you have an e-mail address, by chance?
VECCHIO: Yeah. Yeah.
BURIL: If I could get that from you.
We're going to take a ten-minute break and then we'll reconvene on the DTSC things.
Vera, Gary, thank you very much. It was very helpful.
YAMAMOTO: Thank you. Glad to be of some assistance.
(A recess was taken from 2:55 P.M. until 3:11 p.m.)
(Mr. Robles, Mr. Yamamoto, Ms. Vecchio, Ms. Mahoney and Mr. Jackson departed.)
(Mr. Ripperda disconnected.)
BURIL: We're back.
B.G., which ones did you want to specifically talk to? We can go through each one of them, but some of these look like they're relatively --
GEBERT: Unless you have a specific concern about them, there's no reason to do that.
BURIL: Which ones are you looking at?
RANDOLPH: Looking under General Comments, number 3.

GEBERT: Significant water vapor?
RANDOLPH: Right.
BURIL: What are we trying to get to there?
RANDOLPH: How can we tell what soil vapor is, or the vapor moisture or water vapor?
CHRISTMANN: We were looking more at did you have any records of moisture in the probes, probes inundated.
RANDOLPH: We have some that were plugged, we know that, with water, where we could blow but couldn't purge with a syringe.
CHRISTMANN: I think that's the kind of information Joe was looking for.
RANDOLPH: Because "significant water vapor," I have no idea what that meant other than that. But we had no signs of any vapor condensation in the syringes.
CHRISTMANN: That's the only -- if you didn't have any records of that, then --
RANDOLPH: We didn't have it. I did all the sampling.
CHRISTMANN: Right.
RANDOLPH: That was observation.
BURIL: So all we have to do, then, is just make a note in the text that says "During sampling there

was no noted soil moisture condensing in the syringe or in the lines, and therefore should not be an issue."
CHRISTMANN: Right.
HWONG: Yeah.
BURIL: Okay. Great.
RANDOLPH: Okay.
BURIL: What else you got?
RANDOLPH: Let's see. Down at the bottom of that first page, Contaminant Source Investigation, number 2. What is meant by "co-located analytical results for soil versus soil vapor"?
HWONG: What I mean right here is you got the vapor sample and if you have -- also have sent that, the soil sample, you can just go ahead, you know, correlate it and let me know what's the comparison between the result.
BURIL: That may be born of no previous knowledge of the project. Because when we first started the soil vapor aspect, we agreed with the Regional Board that we would not analyze the soil samples themselves for volatiles, because they mistrusted the analysis because of the sampling technique and all that. They would only accept the vapor studies. So we did no soil analyses

whatsoever --
HWONG: Okay.
BURIL: -- for volatiles.
CHRISTMANN: Did you have any previous soil matrix analyses that had been done before?
BURIL: Before that agreement?
CHRISTMANN: Yeah.
BURIL: I don't think so, but -- no. I don't think so.
CHRISTMANN: Because I know some of the older data you did have some -- you did, obviously, have some VOCs.
BURIL: Some of that stuff was -- that might have been done maybe during construction as opposed to --
CHRISTMANN: Yeah. And if -- I'd say it's probably worth going back and looking if you had --
BURIL: If we have something like that?
CHRISTMANN: If you have some comparison you can do like that. If not --
BURIL: We'll take a look at the data. If we don't have it, then we won't provide it. But otherwise --
CHRISTMANN: Right. You can't provide it if you don't have it.

BURIL: What else you got, B.G.?
RANDOLPH: I'm making some notes here, Chuck.
BURIL: Okay.
RANDOLPH: I guess we go to the next page, number 5. There was no water poured into any of the holes during construction.
HWONG: Okay.
BURIL: We just note that in the text.
RANDOLPH: During well construction.
BURIL: You're talking about the soil vapor wells. Right?
HWONG: Yeah.
BURIL: Yeah. Okay.
RANDOLPH: The only place -- oh, I guess it would just be for a little bit of water that goes in to hydrate the bentonite in the middle of each bentonite section.
BURIL: Do you want that kind of info in there? Is that what you're thinking?
HWONG: Eventually -- you know, normally when we contract those well, people asking "Okay, I put some bentonite, couple buckets of water in there." But, you know, how much water exactly did you pour in here is something you don't know if you don't have records.

RANDOLPH: Probably one to two gallons, three gallons at the very most in the middle of the sections, because the bentonite naturally hydrates itself from the moisture that's in the soil.
BURIL: Let's just make a note of that in the text.
RANDOLPH: Two to three gallons in the middle of each bentonite section.
BURIL: Okay. We'll just make a note of that in the text, then.
Would that address your comment, Joe?
HWONG: Uh-huh. Uh-huh.
BURIL: Okay. What else you got, B.G.?
RANDOLPH: "Quantity of bentonite pellets used to absorb groundwater at the bottom of each boring." Basically, what we have is footages, not quantities. That's noted on the boring logs.
HWONG: Okay.
RANDOLPH: Or the well construction logs. We only have a total of the amount of bentonite that was used in each hole.
BURIL: If we know the footage of bentonite in the bottom of the hole, we know the diameter of the hole, we can calculate volume.
Would that be sufficient for you?

Do you have that footage information?
RANDOLPH: Oh, yes.
CHRISTMANN: So you can give us --
BURIL: You can estimate it, assuming the volume of a cylinder, there's so many X cubic feet of bentonite placed in the bottom, that kind of thing.
I think that the next one, the 3-D representation or contour maps, this is one that gets asked for a number of times and it's very difficult for us to try to comply with this, and the reason being at JPL, you probably noticed that we've got pretty good topographic relief throughout the site. It's on the order of hundreds of feet.
HWONG: Uh-huh.
BURIL: It's very, very difficult to depict that in any way, shape or form that's useful in doing cross-sections or anything like that. And so we've not found a way except through plan view to try and give an idea of where things are. We've put in a cross-sectional kind of approach where we had -- what were those, B.G.? We had those -- I don't want to call them soil logs, but they were indicating across a given section where the different borings were and what the concentrations were just to give some idea.

But because of the way that certain of the borings would terminate at depths that were maybe halfway down, another boring was at a lower depth or a lower elevation when it was put in, so there wasn't a real uniform way of looking at this.

And we haven't come up with a means of doing that at this point other than try in two dimensions.

GEBERT: I think Alex and Mark had some comments.

BURIL: We were going to talk about doing the baseline stuff and getting similar elevations together, and so forth.

GEBERT: Yeah. Our comments were on those same lines.

RANDOLPH: Right. I recall those. Just for everybody's knowledge, you've got to remember each one of these grids is 500 feet by 600 feet. The borings range from here to here and from down here to up here.

BURIL: So it's a big area.

RANDOLPH: You're talking about a boring that -- well, you'd have to almost -- if you try to do anything, the vertical scale would only be one-tenth of the horizontal scale. So you have to exaggerate

the horizontal scale or actually --

BURIL: I think what Richard is saying, though, is that we talked about this at the last RPM meeting. It sounds like if we approach the comment in the same fashion that Mark and Alex talked about, we should be okay.

GEBERT: Right.

BURIL: Okay. We'll do that.

Okay, B.G., which is the next one you're looking at?

RANDOLPH: The next one.

BURIL: Number 8?

RANDOLPH: Number 8. That relates to another one. I'm pretty sure the number 11 down there in Summary and Conclusions refers to the comment number 8 in Section 4. I think they're associated. But even noted on the boring log, that 6500 milligrams per kilogram at 20 feet is noted on the boring logs that that's asphalt granule that's in the fill.

HWONG: In the fill?

RANDOLPH: That's where we went right down through one of the old seepage pits.

BURIL: Oh, okay. Is that noted in -- it's noted in the log. Is it noted in the text?

RANDOLPH: It's noted in the log.

BURIL: Is it noted in the text?

RANDOLPH: We can add a comment or two.

BURIL: Why don't we add a comment in the text and bring that out so there's no confusion in that.

HWONG: Okay.

RANDOLPH: I guess the figure, you already mentioned it under Figures. It's under number 14.

HWONG: Yup. Yup.

RANDOLPH: That relates to the same thing.

All the others are basically really no problem.

BURIL: Okay. How about the risk assessment ones?

RANDOLPH: I have no comments on those whatsoever, and neither do our risk assessment people.

BURIL: So we have no issues with these as far as being able to address them.

Then I think we're done.

Is there anything else we want to talk about while we're all sitting here as far as how things are going, or whatever? You fellows want the tour, I know. I'm going to give Kathy a call here as soon as we call the meeting over.

Is there anything else we want to talk

about?

GEBERT: No.

BURIL: All right. We'll call it done, then. Thank you very much.

The official record is closed.

(The proceedings adjourned at 3:24 P.M.)

MEETING ATTENDANCE RECORD

Environmental Affairs Office
Looking Beyond Tomorrow

NASA/JPL SUPERFUND SITE
INFORMATIONAL MEETING
May 26, 1999

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